

DISCUSSION OF THE AMENDMENT

Claims 1 and 12 have each been amended, as supported in the specification at page 13, lines 9-14.

Claims 9 and 10 have been canceled.

No new matter is believed to have been added by the above amendment. Claims 1-4, 6-8 and 11-14 are now pending in the application.

REMARKS

Applicants thank the Examiner and the Examiner's supervisor for the courtesy extended to Applicants' attorney during the interview held September 23, 2009, in the above-identified application. During the interview, Applicants' attorney explained the presently-claimed invention and why it is patentable over the applied prior art. The discussion is summarized and expanded upon below.

The rejection of Claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over US 5,641,855 (Scherr et al), is respectfully traversed. Indeed, the rejection is now moot in view of the above-discussed amendment. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejections under 35 U.S.C. § 103(a) of:

Claims 1-4 and 6-8 as unpatentable over US 6,573,228 (Littig et al), and

Claims 11-14 under 35 U.S.C. § 103(a) over Littig et al in view of US 2003/0195135 (Boeckh et al),

are respectfully traversed.

An embodiment of the present invention, as recited in above-amended Claim 1, is a composition for treating hard surfaces, which composition, as component A thereof, is at least one water-soluble or water-dispersible compound which is prepared by

- aa) first crosslinking a compound selected from the group consisting of polyalkylenepolyamines, polyamidoamines grafted with ethyleneimine, polyether-amines and mixtures of said compounds, as component Aa,
- ab) with a compound selected from the group consisting of bifunctional crosslinkers having, as a functional group, a halogenhydrin, glycidyl,

- aziridine or isocyanate unit or a halogen atom, as component Ab,
thereby forming a crosslinked reaction product, and
ac) then reacting, by a Michael addition reaction at a temperature of from
30 to 100 °C, the crosslinked reaction product with a
monoethylenically unsaturated carboxylic acid selected from the group
consisting of acrylic acid, methacrylic acid, ethylacrylic acid, salts,
esters, amides or nitriles of monoethylenically unsaturated carboxylic
acids, and mixtures thereof.

As Applicants' attorney pointed out during the above-referenced interview, it is important that the order of the process steps is maintained. Component A obtained according to the present invention provides for excellent properties with regard to rapid and streak-free drying, avoidance or reduction of the condensation of water etc. on hard surfaces, as described in the specification at page 2, last paragraph. As described in the specification at page 12, lines 30-34, only by the order according to the process of the present invention such results are obtained.

As previously pointed out, Littig et al discloses laundry detergent compositions comprising so-called fabric enhancement polyamines which comprise one or more modified polyamine compounds selected from:

- i) $(PA)_w(T)_x$;
- ii) $(PA)_w(L)_z$;
- iii) $[(PA)_w(T)_x]_y[L]_z$; and
- iv) mixtures thereof (column 1, line 61 to column 2, line 1).

PA is a grafted or non-grafted, modified or unmodified polyamine backbone unit, T is an amide-forming polycarboxylic acid cross-linking unit, and L is a non-amide-forming cross-linking unit (column 2, lines 1-5). Suitable polyamine backbones (PA units) are, for

example, polyalkyleneimines or polyalkyleneamines (column 3, lines 30-38). The polyamine backbone may be modified by grafting or capping (column 5, lines 13-16). The grafting is carried out for example with aziridine (ethyleneimine), caprolactam or mixtures thereof, as grafting agents (column 5, lines 35-37) and the grafting can be carried out prior to or after cross-linking with one or more T-units, whereby the grafting is preferably accomplished after cross-linking with the T-unit (column 5, lines 51-54). The capping is carried out by reaction of the PA-unit with a monocarboxylic acid. Suitable monocarboxylic acids disclosed are C₁-C₂₂ linear or branched alkyl, preferably C₁₀-C₁₈ linear alkyl carboxylic acids like lauric acid and myristic acid (column 5, lines 60-65), which are the only acids explicitly listed. The cross-linking units T are amide-forming cross-linking units, for example, dibasic acids such as succinic acid, maleic acid, adipic acid, glutaric acid, suberic acid, sebacic acid and terephthalic acid (column 6, lines 28-31). Non-amide-forming cross-linking units L are, for example, epihalohydrins (column 6, lines 54-56).

The Examiner particularly relies on Littig et al's disclosure of a preferred embodiment in which water soluble condensation products can be obtained by reaction of polyalkyleneimines or polyalkyleneamines grafted with ethyleneimines, or mixtures thereof, with **bifunctional** halogen-free cross-linking agents which may be, *inter alia*, mono-ethylenically unsaturated carboxylic acids such as acrylic acid and methacrylic acid, or particular aziridine-group containing compounds (column 9, lines 18-44).

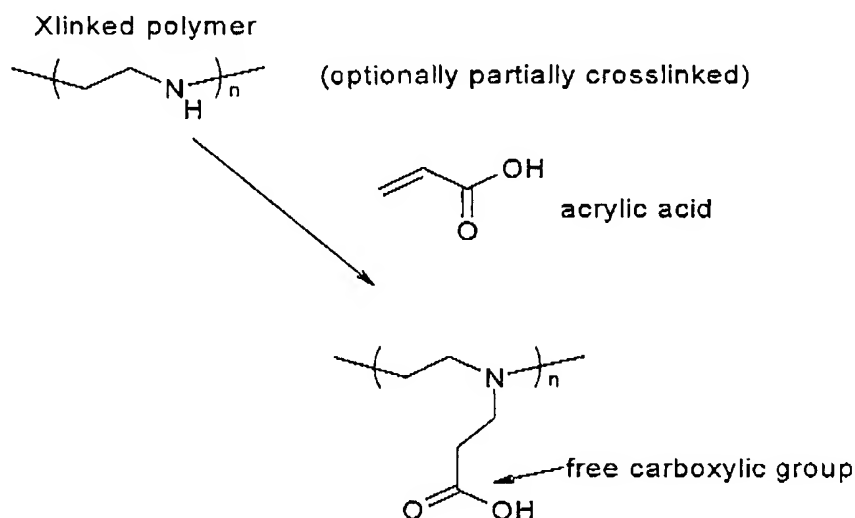
In the Office Action, the Examiner concedes that Littig et al "do not specifically teach the product which is produce [sic, produced] from the reaction of grafted polyalkyleneamines, aziridine and unsaturated carboxylic acid in step by step correspondingly as said by the applicant. However, according to the MPEP, changing in steps of the process or splitting of one step into two was held to not patentably distinguish process."

In reply, if the rationale of the Examiner is simply that changing the order of steps in a process is unpatentable, this is clearly not the law, as noted by Applicants' attorney during the interview. The Examiner **must** consider each case on its specific facts, as mandated by 35 U.S.C. § 103(a) that the subject matter **as a whole** be considered.

In the Office Action, the Examiner further finds that a Michael addition reaction is not recited in the claims, in response to Applicants' argument that this is precisely what occurs in the recited process.

In reply, such Michael addition reaction is now positively recited in the claims, thus resulting in a Michael addition product.

As previously presented, the following scheme shows the partial structure of the reaction product obtained by reacting crosslinked polyethyleneimine with an α,β -unsaturated carboxylic acid by a Michael-addition:



It is shown that component A according to the present invention comprises free carboxylic groups (COOH). It is believed that the presence of such carboxylic groups provide for superior results because these may interact with the water which runs off, especially in their anionic form COO^- , and repel dirt.

At the same time the nitrogen atoms N in the chain of the crosslinked polymer may be protonized forming ammonium ions which are believed to interact with the surface. In one preferred embodiment of the invention, compound A may be rendered amphoteric which can be a special advantage with regard to the interaction with the surface to be cleaned.

According to the embodiment discussed above relied on by the Examiner, Littig et al's monocarboxylic acids like acrylic acid act as cross-linking agents to cross-link polyalkyleneimines or polyalkyleneimines grafted with ethyleneimines. No Michael addition of a cross-linked product takes place in Littig et al. Indeed, to act as a crosslinking agent, and as Applicants' attorney pointed out during the interview, the acrylic acid necessarily acts by reacting **at both ends** with the reaction partners such as polyalkyleneimines. This means forming bonds via the double bond **and** the carboxylic group with the consequence that finally there is no double bond and, what is more important in the present context, there is no free carboxylic group but e.g. an acrylamide group wherein the nitrogen atom N of the amide is a constituent of the original polyalkyleneimine. Such a reaction is a condensation reaction, the amide is a condensation product and water is split off. As shown above, the Michael type reaction according to the present invention is quite different from this and does not lead to condensation products and splitting off of water. Therefore, the process and the products obtained according to Littig et al are clearly different from the present invention and have clearly different properties as discussed above, especially because free carboxylic groups have been condensed with imino groups under formation of amide groups. Consequently the surface properties of the Littig et al compounds are clearly different due to the lack of carboxylic groups and their negative charge.

Therefore, not only the order of the reaction is changed in the process according to the present invention compared to the process according to Littig et al, but also different reaction steps are carried out leading necessarily to different products.

The Examiner also finds that “the product from the amidation process has been claimed in the invention which is ‘polyamidoamine.’”

In reply, although polyamidoamines are possible educts according to the present invention, they should not be confused with the reaction products of the carboxylic acid according to the present invention. Polyamidoamines are precursors which are crosslinked with the bifunctional crosslinkers recited in subparagraph ab) i.e. halogenhydrin, glycidyl, aziridine or isocyanate forming crosslinked products. Only then, after this crosslinking reaction the second reaction step occurs with, for example, acrylic acid. As explained above, this second reaction is not a condensation reaction but a Michael type reaction which would not yield polyamidoamines.

Summarizing, compounds and processes according to the present invention are clearly distinguished from the teaching of Littig et al.

The products obtained are therefore clearly different and the products especially comprise a completely different polarity, which is important for the usefulness of said products for treating hard surfaces.

In effect, Littig et al is irrelevant, because their modified polyamine compounds are different from, and not suggestive of, presently-recited component A, and their disclosed utility is not the treatment of hard surfaces.

Claims 11-14 are drawn to a process for the treatment of hard surfaces. Claims 11, 13 and 14 require the composition of Claim 1. Claim 12 requires, in effect, only component A of Claim 1.

As previously pointed out, Boeckh et al discloses particular cationically modified, particulate, hydrophobic polymers, the surfaces of which have been cationically modified by coating with cationic polymers, and the particle size of which is 10 nm to 100 μ m, as additives to rinse, cleaning and impregnation compositions for hard surfaces (Abstract).

Present component A, on the other hand, is recited as water-soluble or water-dispersible and for this reason alone, is different from the hydrophobic polymers of Boeckh et al. Boeckh et al.'s hydrophobic polymers are obtainable, for example, by polymerization of, in effect, monoethylenically unsaturated monomers [0015ff], which are cationically modified by cationic polymers containing, for example, vinyl amine units, including polyethylene imines and crosslinked polyethylene imines, *inter alia* [0047]. Thus, it is clear that the polymeric backbone of Boeckh et al.'s hydrophobic polymers is a hydrophobic acrylate-type polymer. On the other hand, present component A is a water-soluble or water-dispersible compound having a backbone of polyalkylene polyamine, polyamidoamine, polyamidoamine grafted with ethylene amine, polyether amine, or mixtures thereof, recited as component Aa. Thus, the water-soluble or water-dispersible compounds are polyalkylene polyamines or similar polymers. Nor are these compounds cationically modified as required by Boeckh et al. While component A is recited in product-by-process form, it is clear that component A could not possibly be the hydrophobic polymers of Boeckh et al.

The Examiner appears to hold that it would have been obvious to use the so-called fabric enhancement polyamines of Littig et al to clean hard surfaces in view of Boeckh et al. In so holding, the Examiner finds that Littig et al and Boeckh et al are "analogous art because they are in the same field of endeavor, namely, a cleaning composition comprising the similar compound which is used as soil release agent."

In reply, Littig et al and Boeckh et al are non-analogous art because they are not in the same field of endeavor, i.e., cleaning hard surfaces and cleaning laundry are different fields of endeavor, and even though not in the same field of endeavor, nor is Littig et al reasonably pertinent to the particular problem with which Applicants are involved. Nevertheless, even if analogous art, Applicants have shown above why the presently-recited component A (Claims 11, 13 and 14) or water-soluble or water-dispersible compound (Claim 12) is different from,

and not suggested by, Littig et al. Alternatively, there is no motivation to substitute the cationically modified hydrophobic polymers of Boeckh et al with the above-discussed hydrophilic polymers of Littig et al. In addition, since Boeckh et al disclose cationically modified hydrophobic polymers for the treatment of hard surfaces, Boeckh et al lead away from the use of the specific hydrophilic polymers for treating hard surfaces as claimed herein.

In the Final Rejection, the Examiner continues to find that Littig et al and Boeckh et al are combinable because they are both drawn to "cleaning" compositions and disclose "similar" compounds.

In reply, and as discussed above, and as pointed out during the interview, the respective cleaning compositions are intended to clean non-overlapping substrates, and the compounds are not similar.

For all the above reasons, it is respectfully requested that the rejections be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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